AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for determining a search range for an adaptive motion vector in a video encoder, the video ~~decoder~~ encoder receiving input image signals representing a continuity of images, and dividing images of the input image signals into a plurality of macro blocks (MBs) so as to estimate a movement of a motion vector of a macro block for encoding images, the method comprising the steps of:

(a) determining the number of neighboring blocks adjacent to a current macro block;

(b) determining a motion vector having the greatest movement by finding magnitudes of motion vectors of the neighboring blocks, if the number of the neighboring blocks is greater than 2;

(c) defining a minimum value of ~~the search~~ a search range for ~~the adaptive~~ an adaptive motion vector of the current macro ~~block;~~ block, the minimum value of the search range for the adaptive motion vector varying depending on a sum of the magnitudes of the motion vectors of the neighboring blocks, when the sum of the magnitudes of the motion vectors of the neighboring blocks is equal to `0`, setting the minimum value of the search range for the adaptive motion vector to a predetermined value, which is obtained by adding a predetermined constant to the value of the search range for the adaptive motion vector defined by a user, and then, dividing a resultant value of the search range for the adaptive motion vector by four;

(d) comparing a double of a magnitude of the motion vector with the greatest movement determined at step (b) with the minimum value of the search range for the adaptive motion vector found at step (c) so as to determine a larger value as a value of the search range for the adaptive motion vector; and

(e) comparing the value of the search range for the adaptive motion vector found at step (d) with a value of the search range for the adaptive motion vector defined by ~~a user~~ the user so as to determine a smaller value as a value of a search range of a final adaptive motion vector.

2. (Original) The method as claimed in claim 1, wherein, in step (b), the magnitudes of the motion vectors of the neighboring blocks are found by extracting horizontal and vertical components of the motion vectors of the neighboring blocks.

3-4. (Canceled)

5. (Currently Amended) The method as claimed in ~~claim 4,~~ claim 1, wherein the predetermined constant is `2`.

6. (Currently Amended) A method for determining a search range for an adaptive motion vector in a video encoder, the video encoder receiving input image signals representing a continuity of images, and dividing images of the input image signals into a plurality of macro blocks (MBs) so as to estimate a movement of a motion vector of a macro block for encoding images, the method comprising the steps of:

(a) determining the number of neighboring blocks adjacent to a current macro block;

(b) determining a motion vector having the greatest movement by finding magnitudes of motion vectors of the neighboring blocks, if the number of the neighboring blocks is greater than 2;

(c) defining a minimum value of a search range for an adaptive motion vector of the current macro block, the minimum value of the search range for the adaptive motion vector varying depending on a sum of the magnitudes of the motion vectors of the neighboring blocks;

(d) comparing a double of a magnitude of the motion vector with the greatest movement determined at step (b) with the minimum value of the search range for the adaptive motion vector found at step (c) so as to determine a larger value as a value of the search range for the adaptive motion vector; and

(e) comparing the value of the search range for the adaptive motion vector found at step (d) with a value of the search range for the adaptive motion vector defined by a user so as to determine a smaller value as a value of a search range of a final adaptive motion vector,~~The method as claimed in claim 3,~~

wherein the minimum value of the search range for the adaptive motion vector is set to a predetermined value, the predetermined value being obtained by adding a predetermined constant to the value of the search range for the adaptive motion vector defined by ~~a user,~~ the user, multiplying a resultant value of the value of the search range for the adaptive motion vector by three, and then, dividing a resultant value of the search range for the adaptive motion vector by 16, if the sum of the magnitudes of the motion vectors of the neighboring blocks is greater than zero and equal to or less than two.

7. (Original) The method as claimed in claim 6, wherein the predetermined constant is `8`.

8. (Currently Amended) A method for determining a search range for an adaptive motion vector in a video encoder, the video encoder receiving input image signals representing a continuity of images, and dividing images of the input image signals into a plurality of macro blocks (MBs) so as to estimate a movement of a motion vector of a macro block for encoding images, the method comprising the steps of:

(a) determining the number of neighboring blocks adjacent to a current macro block;

(b) determining a motion vector having the greatest movement by finding magnitudes of motion vectors of the neighboring blocks, if the number of the neighboring blocks is greater than 2;

(c) defining a minimum value of a search range for an adaptive motion vector of the current macro block, the minimum value of the search range for the adaptive motion vector varying depending on a sum of the magnitudes of the motion vectors of the neighboring blocks;

(d) comparing a double of a magnitude of the motion vector with the greatest movement determined at step (b) with the minimum value of the search range for the adaptive motion vector found at step (c) so as to determine a larger value as a value of the search range for the adaptive motion vector; and

(e) comparing the value of the search range for the adaptive motion vector found at step (d) with a value of the search range for the adaptive motion vector defined by a user so as

to determine a smaller value as a value of a search range of a final adaptive motion vector, ~~The method as claimed in claim 3,~~

wherein the minimum value of the search range for the adaptive motion vector is set to a predetermined value, the predetermined value being obtained by adding a predetermined constant to the value of the search range for the adaptive motion vector defined by ~~a user,~~ the user, and then, dividing a resultant value of the search range for the adaptive motion vector by eight, if the sum of the magnitudes of the motion vectors of the neighboring blocks is greater than two.

9. (Original) The method as claimed in claim 8, wherein the predetermined constant is `4`.

10. (Currently Amended) The method as claimed in claim 1, wherein the value of the search range for the adaptive motion vector defined by ~~a user~~ the user is a default value set by the user in order to prevent an error when starting an encoding process.

11. (Currently Amended) The method as claimed in claim 1, wherein the value of the search range for the adaptive motion vector defined by ~~a user~~ the user is determined as the value of the search range for ~~the final~~ a final adaptive motion vector, if the number of the neighboring blocks is less than one.

12. (Currently Amended) An apparatus for determining a search range for an adaptive motion vector in a video encoder, the video encoder receiving input image signals representing a continuity of images, and dividing images of the input image signals into a plurality of macro blocks (MBs) so as to estimate a movement of a motion vector of a macro block for encoding images, the apparatus comprising:

a determination part for determining the number of neighboring blocks adjacent to a current macro block;

a calculation part for calculating a minimum value of ~~the search~~ a search range for ~~the adaptive~~ an adaptive motion vector of the current macro block or magnitudes of the motion vectors of the macro blocks;

a first comparison part for comparing ~~the double of~~ twice the magnitude of the motion vector having the greatest movement from among the magnitudes of the motion vectors of the neighboring blocks calculated in the calculation part with the minimum value of the search range for the adaptive motion vector calculated in the calculation part;

a decision part for deciding a larger value as a value of the search range for the adaptive motion vector, according to a comparison result of the first comparison part;

a second comparison part for comparing the value of the search range for the adaptive motion vector calculated in the calculation part with a value of the search range for the adaptive motion vector defined by a user; and

a final decision part for deciding a smaller value as a value of the search range for ~~the final~~a final adaptive motion vector, according to a comparison result of the second comparison ~~part.~~ part, wherein

the calculation part differently calculates the minimum value of the search range for the adaptive motion vector depending on the sum of the magnitudes of the motion vectors of the neighboring blocks, and

the minimum value of the search range for the adaptive motion vector is set to a predetermined value, the predetermined value being obtained by adding a predetermined constant to the value of the search range for the adaptive motion vector defined by the user, and then, dividing a resultant value of the search range for the adaptive motion vector by four, if the sum of the magnitudes of the motion vectors of the neighboring blocks is equal to zero.

13. (Original) The apparatus as claimed in claim 12, wherein the magnitudes of the motion vectors are obtained by extracting horizontal and vertical components of the motion vectors.

14-15. (Canceled)

16. (Currently Amended) The apparatus as claimed in ~~claim 15,~~ claim 12, wherein the predetermined constant is `2`.

17. (Currently Amended) An apparatus for determining a search range for an adaptive motion vector in a video encoder, the video encoder receiving input image signals representing a continuity of images, and dividing images of the input image signals into a plurality of macro blocks (MBs) so as to estimate a movement of a motion vector of a macro block for encoding images, the apparatus comprising:

a determination part for determining the number of neighboring blocks adjacent to a current macro block;

a calculation part for calculating a minimum value of a search range for an adaptive motion vector of the current macro block or magnitudes of the motion vectors of the macro blocks;

a first comparison part for comparing twice the magnitude of the motion vector having the greatest movement from among the magnitudes of the motion vectors of the neighboring blocks calculated in the calculation part with the minimum value of the search range for the adaptive motion vector calculated in the calculation part;

a decision part for deciding a larger value as a value of the search range for the adaptive motion vector, according to a comparison result of the first comparison part;

a second comparison part for comparing the value of the search range for the adaptive motion vector calculated in the calculation part with a value of the search range for the adaptive motion vector defined by a user; and

a final decision part for deciding a smaller value as a value of the search range for a final adaptive motion vector, according to a comparison result of the second comparison part, wherein

the calculation part differently calculates the minimum value of the search range for the adaptive motion vector depending on the sum of the magnitudes of the motion vectors of the neighboring blocks, and

~~The apparatus as claimed in claim 14, wherein~~ the minimum value of the search range for the adaptive motion vector is set to a value, the value being obtained by adding a predetermined constant to the value of the search range for the adaptive motion vector defined by ~~a user,~~ the user, multiplying a resultant value of the search range for the adaptive motion vector by three, and then, dividing a resultant value of the search range for the adaptive motion vector

by 16, if the sum of the magnitudes of the motion vectors of the neighboring blocks is greater than zero and less than or equal to two.

18. (Original) The apparatus as claimed in claim 17, wherein the predetermined constant is `8`.

19. (Currently Amended) An apparatus for determining a search range for an adaptive motion vector in a video encoder, the video encoder receiving input image signals representing a continuity of images, and dividing images of the input image signals into a plurality of macro blocks (MBs) so as to estimate a movement of a motion vector of a macro block for encoding images, the apparatus comprising:

a determination part for determining the number of neighboring blocks adjacent to a current macro block;

a calculation part for calculating a minimum value of a search range for an adaptive motion vector of the current macro block or magnitudes of the motion vectors of the macro blocks;

a first comparison part for comparing twice the magnitude of the motion vector having the greatest movement from among the magnitudes of the motion vectors of the neighboring blocks calculated in the calculation part with the minimum value of the search range for the adaptive motion vector calculated in the calculation part;

a decision part for deciding a larger value as a value of the search range for the adaptive motion vector, according to a comparison result of the first comparison part;

a second comparison part for comparing the value of the search range for the adaptive motion vector calculated in the calculation part with a value of the search range for the adaptive motion vector defined by a user; and

a final decision part for deciding a smaller value as a value of the search range for a final adaptive motion vector, according to a comparison result of the second comparison part, wherein

the calculation part differently calculates the minimum value of the search range for the adaptive motion vector depending on the sum of the magnitudes of the motion vectors of the neighboring blocks, and

~~The apparatus as claimed in claim 14, wherein~~the minimum value of the search range for the adaptive motion vector is set to a predetermined value, the predetermined value being obtained by adding a predetermined constant to the value of the search range for the adaptive motion vector defined by ~~a user,~~ the user, and then, dividing a resultant value of the search range for the adaptive motion vector by eight, if the sum of the magnitudes of the motion vectors of the neighboring blocks is greater than two.

20. (Original) The apparatus as claimed in claim 19, wherein the predetermined constant is `4`.

21. (Currently Amended) The apparatus as claimed in claim 12, wherein the value of the search range for the adaptive motion vector defined by ~~a user~~ the user is a default value set by the user in order to prevent an error when starting an encoding process.

22. (Currently Amended) The apparatus as claimed in claim 12, wherein the final decision part determines the value of the search range for the adaptive motion vector defined by ~~a user~~ the user as the value of the search range for the final adaptive motion vector, if the number of the neighboring blocks is less than one according to a result of the determination part.